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Environmental restoration program:
monthly report for November 1991

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ENVIRONMENTAL RESTORATION PROGRAM

Monthly Report For *November, 1991*

December 20, 1991

EG&G ROCKY FLATS

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U.S. DEPARTMENT OF ENERGY
ROCKY FLATS PLANT

ENVIRONMENTAL RESTORATION PROGRAM

MONTHLY REPORT FOR

NOVEMBER 1991

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1.0 INTRODUCTION

This Monthly Status Report presents the current status and technical achievements of the Rocky Flats Environmental Restoration Program for November 1991. This Program implements the Interagency Agreement (IAG) between the U.S. Department of Energy, the U.S. Environmental Protection Agency, and the State of Colorado to investigate, assess, and remediate, where necessary, contaminated areas at or adjacent to DOE's Rocky Flats Plant in Golden, Colorado. This agreement was signed on January 22, 1991. The work is being performed for DOE by EG&G Rocky Flats, Inc.

Section 2.0 of this report, the Executive Summary, highlights significant achievements and summarizes the milestones completed during November. It also presents any major unresolved issues of the program. Technical progress, schedule status, and milestone status for each Operable Unit as well as other program activities are presented in Section 3.0. Work in Operable Units will be reported as it commences. Section 4.0 contains the schedules for routine environmental sampling as required by paragraph 210 of the Interagency Agreement. Section 5.0 contains a list which identifies the contractors and subcontractors performing work on the Program as required by paragraph 13 of the IAG.

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2.0 EXECUTIVE SUMMARY

2.1 SIGNIFICANT ACTIVITIES AND ACHIEVEMENTS FOR NOVEMBER 1991

Drilling and sampling activities continued during November on the OU 1 881 Hillside. A total of 95 holes (56 boreholes, 23 monitor wells, 16 abandoned wells) have been drilled on this Phase III Project as of November 26, 1991.

OU 1 Phase II-B french drain excavation scheduled to start in October was delayed due to poor weather conditions. The new Buffer Zone gate was installed and ground breaking occurred on Wednesday, November 6, 1991. At the month's end the new power poles had been placed, and the electrical work to relocate the power lines was completed. Excavation activities continued on the sump pit at the east end of the french drain. Work activities on the west end of the french drain were delayed due to wetland issues and threatened and endangered species concerns which need to be addressed prior to any work activities resuming on the west end. The Corps of Engineers has been contacted and the issue is being considered. Delays beyond December 15, 1991 may impact the completion schedule.

The OU 1 Phase II-A effluent tank work continues. Foundation construction work for the tanks is complete, and tank erection is in progress. Due to winter weather conditions, the tank work has fallen behind schedule. Work is planned for the weekends to make up lost time. Delivery of the ion exchange unit has been delayed. Seismic qualifications are required before shipment; the ion exchange manufacturer is pursuing these. Delivery is scheduled for the second week in December.

The OU 2 alluvial drilling program is on schedule with 38 monitoring wells and 6 boreholes completed to date. Volatile organic core sampling and other analytical testing is on schedule. Fifteen test pits in the surficial soil sampling task have been completed to date.

EPA and CDH have formally approved the OU 2 Phase II RFI/RI Work Plan (Alluvial) which was submitted as Technical Memorandum One. Technical Memorandum Two - Chemical Analysis Plan, which provides a plan for chemical analyses of environmental samples, was also approved omitting sediment samples from the modified analyte list.

The OU 2 Granular Activated Carbon (GAC) treatment system collected, treated, and discharged 906,895 gallons of surface water during November 1991. The system continues 24-hour manned operation. The solicitation period for bids for the OU 2 IRA radionuclide removal system ended at the close of business on November 26, 1991. Selection of a vendor and contract award is scheduled to take place on December 23, 1991.

Modifications to the Phase I RFI/RI Work Plan for OU 3 Offsite Areas are being made based on regulatory agency comments. Revegetation activities on OU 3 required under the Settlement Agreement continued through November on Jefferson County Open Space Land.

The Final Phase I RFI/RI Work Plan for OU 4 Solar Evaporation Ponds was delivered to the regulatory agencies on November 26, 1991, the IAG milestone date.

Incorporation of comments from EPA and CDH into the Final Phase I RFI/RI Work Plan for OU 5 Woman Creek Priority Drainage continued. Submittal of the revised Work Plan was extended from December 1, 1991 to December 9, 1991.

incorporation of comments from EPA and CDH into the Final Phase I RFI/RI Work Plan for OU 6 Walnut Creek Drainage continued. Submittal of the Work Plan is scheduled for December 15, 1991.

EPA and CDH comments are being incorporated into the final Phase I RFI/RI Work Plan for OU 7 - Present Landfill. The revised final Work Plan is scheduled to be delivered to the regulatory agencies on December 6, 1991.

The Final Phase I RFI/RI Work Plan for OU 9 was delivered to the regulatory agencies on November 26, 1991, the IAG milestone date.

The draft Phase I RFI/RI Work Plan for OU 10 was submitted to the regulatory agencies on November 26, 1991, one day ahead of the IAG milestone date.

The Final Plan for Prevention of Contaminant Dispersion (PPCD) and Responsiveness Summary (RS) were delivered to EPA and CDH on November 25, 1991, the IAG milestone date.

The public comment period for the Discharge Limits for Radionuclides Work Plan ended on November 21, 1991.

With the exception of a winter survey to be performed in January or February 1992, environmental evaluation field sampling for OU 1, OU 2, and OU 5 is now complete. Fall flora and fauna tissue and ecological community survey field activities for OU 1, OU 2, and OU 5 environmental evaluations have been completed.

Two Plutonium in Soils Treatability Study Work Plans were submitted to EPA and CDH on November 29, 1991. The Work Plans included in this document address Magnetic Separation and the TruClean Process: two technologies selected for the treatability studies in the final Treatability Study Plan dated August 26, 1991. All comments from DOE, EG&G RFP, EG&G Nevada and Los Alamos Office of Technology have been incorporated into this document.

The complete Administrative Record File Index, consisting of all the Operable Units and the Sitewide Program, was delivered to EPA and CDH for review and comment on November 5, 1991.

2.2 PROBLEMS AND PROGRAMMATIC ISSUES

The delay in removal of sludge from the solar ponds and the requirement for an IM/IRA for the surge tanks will impact the scheduled start of the OU 4 RFI/RI field activities in January 1992. The public comment period for the OU 4 Solar Evaporation Ponds IM/IRA Decision document was closed on November 9, 1991. Completion of the first draft of the Final IM/IRA Plan, including revisions, is scheduled for early January 1992.

The IAG schedule to obtain permits for the field activities for OU 5 and OU 6 has been delayed because of FY92 budgetary uncertainties. The Statement of Work (SOW) for the field activities has not been let out for bids because of the disapproval by EPA and CDH of the final Work Plan for OU 5 and OU 6; therefore, field activities will not begin as currently scheduled in the IAG.

2.3 NEAR-TERM IAG MILESTONES

OU#	Milestone Description	Scheduled Completion	Actual Completion
01	Begin Phase II-B IM/IRA Construction	03 Sep 91	26 Aug 91
SW	Submit Final Radionuclide Discharge Limits Plan	16 Sep 91*	16 Sep 91
06	Submit Final Phase I RFI/RI Work Plan	16 Sep 91	16 Sep 91
02	Complete IM/IRA Construction	30 Sep 91**	
02	Begin Field Treatability Testing (Entire System)	30 Oct 91**	
SW	Submit Responsiveness Summary for PPCD	25 Nov 91*	25 Nov 91
04	Submit Final Phase I RFI/RI Work Plan	26 Nov 91	26 Nov 91
09	Submit Final Phase I RFI/RI Work Plan	26 Nov 91	26 Nov 91
10	Submit Draft Phase I RFI/RI Work Plan	27 Nov 91	26 Nov 91
03	Submit Final Phase I RFI/RI Work Plan	06 Dec 91*	
11	Submit Final Phase I RFI/RI Work Plan	02 Jan 92	
SW	Submit Draft Historical Release Report	08 Jan 92	
SW	Submit Responsiveness Summary RDLP	30 Jan 92	

* indicates a revised date

** Scheduled completion date of September 30, 1991 for the construction milestone and, October 30, 1991 for the testing milestone were not met. With the conclusion of dispute resolution proceedings, EPA and CDH authorized the extension of the construction milestone to April 24, 1992, and the initiation of operations to April 27, 1992.

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3.0 PROJECT STATUS

3.1 OU 1 - 881 HILLSIDE AREA

DESCRIPTION:

The soil and groundwater at the 881 Hillside Area, located north of Woman Creek in the southeast section of RFP, were contaminated in the 1960s and 1970s with solvents and radionuclides. The area is almost two miles from the eastern, outer edge of the plant's buffer zone at Indiana Street. The various Individual Hazardous Substance Sites (IHSSs) that make up OU 1 are being investigated and treated as high-priority sites because of elevated concentrations of organic compounds in the near-surface groundwater and the proximity of the contamination to a drainage system leading to an offsite drinking water supply. The selected Interim Remedial Action (IRA) at OU 1 involves construction of an underground drainage system called a french drain that will intercept and contain contaminated groundwater flowing from the OU 1 area. The contaminated water will be treated at the 891 Treatment Facility, designed for this purpose, and released on site into the South Interceptor Ditch alongside Woman Creek. IRA construction is scheduled to be complete by March 2, 1992. The remedial investigation and feasibility study (RI/FS) to determine the final remedial action is continuing in parallel with the IRA.

3.1.1 OU 1 ASSESSMENT

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Phase III RFI/RI Work Plan	06 Feb 90
Submit Final Phase III RFI/RI Work Plan	31 Oct 90
Begin Phase III RI Field Work	06 Mar 91

NOVEMBER WORK ACTIVITY STATUS:

Drilling and sampling activities continued on the Phase III OU 1 Remedial Investigation (RI) field work. A total of 95 holes have been drilled as of November 26, 1991. The average hole required five samples, which totals approximately 475 downhole samples taken to-date. The composite 95 holes include 56 boreholes, 23 active monitor wells and 16 monitor wells abandoned due to geological conditions. Packer tests were started the week of November 4, 1991 in the deeper boreholes and downhole geophysics was used to support the packer tests. Additional "unique" sampling began the week of November 25, 1991 as called for in the Work Plan. This includes some manhole sampling and sump sampling around the 881 building.

Fall flora and fauna tissue and ecological community survey field activities were completed for OU 1 environmental evaluation. Data analysis of the ecological community survey data began immediately, and tissue samples will be sent to the laboratories as soon as possible.

In a meeting held on November 21, 1991 the public health risk assessment approach for OU 1 was worked out with EPA and CDH. The meeting was held in order to obtain the regulatory agencies input and concurrence with the approach. The work on data evaluation is still behind schedule due to earlier contractual problems; however, these problems have been solved, and work is proceeding.

PLANNED WORK FOR DECEMBER:

Drilling and sampling activities will be completed for the OU 1 RI. Field work is on schedule to be completed on December 18, 1991, the IAG schedule date. Lab work and data validation is scheduled to continue through March 3, 1992.

PROBLEMS: None

OPEN ITEMS: None

3.1.2 OU 1 REMEDIATION

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Proposed IM/IRA Decision Document	18 Sep 89
Submit Proposed IM/IRA Decision Document	06 Oct 89
Submit Final IM/IRA Decision Document	05 Jan 90
Begin Phase I-A IM/IRA Construction	15 Jan 90
Restart Phase I-A IM/IRA Construction (after shutdown)	20 Jun 90
Begin Phase I-B IM/IRA Construction (ahead of schedule)	28 Sep 90
Submit IM/IRA Implementation Document	22 Feb 91
Begin Phase II-A IM/IRA Construction	01 Apr 91
Begin IM/IRA Testing	05 Aug 91
Begin Phase II-B IM/IRA Construction	03 Sep 91

NOVEMBER WORK ACTIVITY STATUS:

OU 1 Phase II-B french drain excavation scheduled to start in October was delayed due to poor weather conditions. The new Buffer Zone gate was installed and ground breaking occurred on Wednesday, November 6, 1991. At month's end the new power poles had been placed, and the electrical work to relocate the power lines was completed. Excavation activities continued on the sump pit at the east end of the french drain.

During excavation activities on November 25, 1991, an existing monitoring well (#687) was accidentally destroyed. Muddy and slippery conditions caused a scraper to slide into the monitoring well. The well will be abandoned and replaced. A geotechnical engineer will be on plantsite for geologic mapping and geotechnical support during excavation. Work activities on the west end of the french drain are delayed because of concerns regarding wetland issues and threatened and endangered species which need to be addressed prior to any work activities resuming at that location. The Corps of Engineers has been contacted and the issue is being reviewed. A release to work on the west end of the french drain must be obtained by mid-December in order to prevent a cost increase and schedule delays.

Westgas Supply Company expressed concerns regarding the crossing of their pipeline with heavy construction equipment (backhoes, scrapers, etc). Westgas originally stated they would require a rigid steel plate and six feet of dirt cover over the pipeline. After further discussions with Westgas, two pipeline crossings will be constructed with 1/2-inch steel plate and three feet of dirt cover.

CPVC pipe installation for the 881 Hillside Phase II-A equipment installation is 95 percent complete and pipe heat tracing and insulation is approximately 80 percent complete. The installation process has been delayed by flange mating problems which were resolved the week of November 18, 1991, when the polypropylene raised-face flanges were changed with full-face flanges. Electrical work in the building continues.

The Phase II-A effluent tank work continues. Foundation construction work for the tanks is complete, and tank erection is in progress. Tank bottoms have been laid out and tack welded in place. The lower shell course has been fit up and tacked on two of the three tanks. Cone roof installation began the week of November 25, 1991. Tank manway and nozzle installation is in progress. Due to winter weather conditions, the tank work has fallen behind schedule. Work is planned for the weekends to make up lost time.

Delivery of the ion exchange unit has been delayed. Seismic qualifications are required before shipment. The ion exchange manufacturer is presently pursuing seismic qualifications. Delivery is expected the second week in December.

PLANNED WORK FOR DECEMBER:

The continued construction of the effluent tanks is planned for December. The construction/excavation activities on the french drain will also continue. The arrival and installation of the ion exchange unit is scheduled to begin the second week of December.

PROBLEMS:

Issues related to wetlands and wildlife regulatory compliance on the OU 1 IRA french drain construction need to be addressed by mid-December to avoid cost increases and schedule delays.

OPEN ITEMS: None

3.2 OU 2 - 903 PAD, MOUND, AND EAST TRENCHES

DESCRIPTION:

The contamination at the 903 Pad and Mound areas is largely attributed to the storage in the 1950s and 1960s of waste drums that corroded over time, allowing hazardous and radioactive material to leak into the surrounding soil. Additional contamination may have resulted from wind dispersion during drum removal and soil movement activities. The East Trenches Area was used for disposal of plutonium- and uranium-contaminated waste and sanitary sewage sludge from 1954 to 1968. Two areas adjacent to the trenches were used for spray irrigation of sewage treatment plant effluent, some of which may have contaminants that were not removed by the treatment system.

An Interim Measures/Interim Remedial Action (IM/IRA) provides for surface water seeps in source areas of contamination to be collected, treated, and discharged to the surface water system. Operation of a field-scale treatability unit began for the Walnut Creek drainage in May 1991. The effectiveness of the treatment process will be evaluated at three locations: the entrance to the treatment facility, several points within the facility, and the discharge point. After completion of the field-scale treatability tests, the unit is anticipated to remain in service until the final remedial action is operational. Bench-scale testing of surface water in the Woman Creek drainage is now being conducted, after which a separate Interim Remedial Action Plan for this drainage will be developed and implemented. The RI and FS to determine the final remedial action are continuing in parallel with the IRA.

3.2.1 OU 2 ASSESSMENT

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Phase II RFI/RI Work Plan (Alluvial)	21 Dec 89
Submit Final Phase II RFI/RI Work Plan (Alluvial)	12 Apr 90
Submit Draft Phase II RFI/RI Work Plan (Bedrock)	05 Feb 91
Submit Final Phase II RFI/RI Work Plan (Bedrock)	02 Jul 91
Begin Phase II-B RFI/RI Field Work	03 Sep 91

NOVEMBER WORK ACTIVITY STATUS:

EPA and CDH have formally approved the OU 2 Phase II RFI/RI Work Plan (Alluvial) which was submitted as Technical Memorandum One. Technical Memorandum Two - Chemical Analysis Plan, was also approved omitting sediment samples from the reduced analyte list. Fifteen test pits in the surficial soil sampling task have been completed to date. The only remaining pits are in the Protected Area (PA).

The Alluvial drilling program is on schedule with 38 monitoring wells and 6 boreholes completed as of November 26, 1991. Drilling operations in the 903 Pad Area were scheduled to begin November 25, 1991. Because of time delays in the Environmental Management Radiological Guidelines, drilling is rescheduled to commence during the second week of December. Volatile organic core sampling and other analytical testing is on schedule.

Fall flora and fauna tissue and ecological community survey field activities for OU 2 are completed. Data analysis of the ecological community survey data began immediately, and tissue samples will be sent to the laboratories as soon as possible.

PLANNED WORK FOR DECEMBER:

Drilling and sampling activities will continue on the OU 2 RI. The field work is scheduled to continue until October 7, 1992.

PROBLEMS:

Fiscal Year 1992 (FY92) budgets have not allocated any funding to the bedrock assessment program; therefore, no drilling or field activities will occur in the bedrock program. The bedrock program will be re-evaluated for FY93.

OPEN ITEMS: None

3.2.2 OU 2 REMEDIATION

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Proposed IM/IRA Decision Document	19 Jun 90
Submit Proposed Plan IM/IRA Decision Document	18 Sep 90
Submit Draft Responsiveness Summary	13 Dec 90
Submit Final Responsiveness Summary and Final IM/IRA Decision Document	11 Jan 91
Field Treatability Test System Installation Complete	10 May 91
Begin Field Treatability Testing (Carbon System)	13 May 91
Complete IM/IRA Construction	*
Begin Field Treatability Testing (Entire System)	*

* Scheduled completion date September 30, 1991 for the construction milestone and October 30, 1991 for the testing milestone were not met. With the conclusion of dispute resolution proceedings, EPA and CDH authorized the extension of the construction milestone to April 24, 1992 and the initiation of operations to April 27, 1992.

NOVEMBER WORK ACTIVITY STATUS:

The South Walnut Creek Granular Activated Carbon (GAC) treatment system collected, treated, and discharged 906,895 gallons of surface water during November 1991. The system continues 24-hour manned operation. During the extremely cold weather in the past month, operations continued without problems. However, treated effluent water required recirculation back to the storage tank to prevent problems with equipment freeze ups.

The solicitation period for bids for the radionuclide removal system ended at the close of business on November 26, 1991. Selection of a vendor and contract award is scheduled to take place on December 23, 1991. The final design is expected to be complete by the end of March 1992 and ordering of long-lead items is to be concurrent with the preparation of the preliminary design.

A meeting was conducted with the regulatory agencies on November 14, 1991 regarding the newly titled Subsurface Investigation Woman Creek Interim Measures/Interim Remedial Action Plan (IM/IRAP). A proposed IM/IRAP outline and schedule for completion of the document were presented and discussed during the meeting. A working meeting was conducted on November 25, 1991 to finalize the scope of the document. The draft document is being developed and is scheduled for delivery to the regulatory agencies on March 2, 1992.

Weekly sampling of the Woman Creek surface water locations (SW-53, SW-55, SW-63, SW-64, SW-77) for gross alpha and beta analysis will be discontinued due to a lack of water in the locations under investigation and a decreased emphasis in the IRAP on surface water flow. Data from previous sampling is being compiled and tabulated. Weekly estimates of flow at these locations and the South

Walnut Creek location (SW-59, SW-61, and SW-132) will continue but will be performed once every two weeks as opposed to weekly.

A draft report on the bench-scale treatability study in support of the OU 2 South Walnut Creek IM/IRA is being prepared. This report will cover activated carbon and precipitation tests which were performed in late 1990 on surface water from the South Walnut Creek Basin. The draft report is scheduled to be completed by December 6, 1991.

PLANNED WORK FOR DECEMBER:

During December the GAC treatment unit will continue operations. Evaluations of bids and the selection of a vendor for the radionuclides removal system is scheduled to be complete by December 23, 1991.

- The development of the draft Subsurface Investigation Woman Creek IM/IRA Plan will continue. The draft report on the bench-scale treatability study in support of the OU 2 South Walnut Creek IM/IRA is being prepared and is scheduled to be completed by December 6, 1991.

PROBLEMS: None

OPEN ITEMS: None

3.3 OU 3 - OFFSITE AREAS

DESCRIPTION:

OU 3 can be divided into two categories based on the two drivers of the activities. The IAG directs activities according to CERCLA. This involves assessment of contamination in offsite areas also referred to as Individual Hazardous Substance Sites (IHSSs): Contamination of the Land Surface (IHSS 199), Great Western Reservoir (IHSS 200), Standley Lake (IHSS 201), and Mower Reservoir (IHSS 202). The second category responds to a 1985 out-of-court lawsuit settlement, McKay v. U.S., which directed that the surface soil contamination be remediated. Remedial activities in compliance with the Settlement Agreement (deep disc plowing) began in 1985. The disturbance resulting from remediation is being revegetated with mediocre success. The overall schedule for this activity is determined by the year-to-year success of the revegetation effort and requirements of the land owners.

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES:

The large number of sediment core samples and the resulting large cost for sample analysis required by the Draft Phase I RFI/RI Work Plan is being reviewed. The revised plan is to obtain sufficient samples to validate older studies rather than conduct a totally new and complete study. A statistical evaluation of the older data is needed to determine the number of samples needed to validate this older data.

MILESTONE ACCOMPLISHMENTS:

Submit Draft Past Remedy Report	26 Oct 90
Submit Draft Historical Information/Preliminary Health Risk Assessment Report	09 Nov 90
Submit Final Past Remedy Report	02 Apr 91
Submit Final Historical Information/Preliminary Health Risk Assessment Report	16 Apr 91
Submit Draft Phase I RFI/RI Work Plan	10 Jul 91

NOVEMBER WORK ACTIVITY STATUS:

Modifications to the RFI/RI Work Plan are being made based on regulatory agency comments. A meeting was held between DOE, EG&G and EPA on October 31, 1991 to present the statistical justification for the number of sampling locations in each geographical location and environmental media. This statistical justification will appear in the appendix to the final Work Plan. A second meeting was held between DOE, EG&G, EPA and CDH on November 5, 1991 to discuss the use of a wind tunnel to measure soil/sediment resuspension. A general approach was presented that will be contained in the Work Plan. Details of the air program will be presented to EPA and CDH in Technical Memoranda following the Final Work Plan as the program becomes better defined. Discussions are continuing with operators of the wind tunnels to resolve specific operating details.

Revegetation activities required under the Settlement Agreement continued through November 1991 on Jefferson County Open Space Land. Seeding with a native plant species mix was completed.

PLANNED WORK FOR DECEMBER:

Preparation of the Final Phase I RFI/RI Work Plan will continue. The Plan is scheduled to be delivered to the agencies on December 6, 1991, the IAG milestone date.

PROBLEMS:

Remedial actions required under the 1985 McKay vs. U.S. Settlement Agreement may be in conflict with CERCLA. Tilling of the land surface to mix plutonium contaminated surface soil, as required under the Settlement Agreement prior to completion of the RI/FS will probably not be allowed by EPA. The remedial action as determined by the RI/FS process, if any, will probably not include plutonium soil mixing through tilling.

OPEN ITEMS: None

3.4 OU 4 - SOLAR EVAPORATION PONDS

DESCRIPTION:

OU 4 is made-up of five solar evaporation ponds: 207A, 207B series (north, center, south), and 207C. Beginning in the late 1950s, the ponds were used to store and evaporate low-level radioactive process water containing high concentrations of nitrates and treated acidic wastes. The sludge and sediments that resulted from the process were periodically removed and disposed at the Nevada Test Site.

As technology improved through the early 1960s and 1970s, the ponds were relined with various upgraded materials. However, leakage from the ponds into the soil and ground water was detected. Interceptor trenches were installed in 1971 to collect and recycle ground water contaminated by the ponds and to prevent natural seepage and pond leakage from entering North Walnut Creek. In 1981, these trenches were replaced by the current, larger, interceptor trench system, which recycles approximately four million gallons of ground water a year back into the solar evaporation ponds.

No additional process water has been pumped into the ponds since 1983. The interceptor trench system collects and recycles ground water into the solar evaporation ponds continuously. Presently, only the 207B north solar evaporation pond receives contaminated ground water collected by the interceptor system. The ponds are RCRA interim status regulated units that are currently under closure. In order to proceed and characterize the level of contamination at the site, approximately eight million gallons of excess liquid in the ponds must be removed. The removal of this liquid and the redirection and treatment of the ground water by the interceptor trench system are the focus of the Interim Remedial Action which is scheduled to begin field work in early 1992.

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Phase I RFI/RI Work Plan	08 Jun 90
Submit Final Phase RFI/RI Work Plan	26 Nov 91

NOVEMBER WORK ACTIVITY STATUS:

The Final Phase I RFI/RI Work Plan for OU 4 Solar Evaporation Ponds was delivered to the regulatory agencies on November 26, 1991, the IAG milestone date.

The public comment period for the OU 4 Solar Evaporation Ponds IM/IRA Decision document was closed on November 9, 1991. Public comments were relatively minor; significant comments were received from EPA and CDH on November 20, 1991. The comments from CDH were focused on an analytical plan for the operation of the flash evaporators. Incorporation of the comments and completion of the draft Final IM/IRA Plan are scheduled for early January 1992.

PLANNED WORK FOR DECEMBER:

The regulatory agencies have until January 6, 1992 to review and approve the Final Phase I RFI/RI for OU 4 Solar Evaporation Ponds Work Plan. Preparation of the Statement of Work for implementation of the OU 4 Work Plan is scheduled for December.

The comments received from the public and the regulatory agencies on the draft IRAP will be reviewed and addressed. Preparation of a Responsiveness Summary to be included in the Final IM/IRA document, as well as the incorporation of the comments and completion of the draft Final IM/IRA are scheduled for early January 1992.

PROBLEMS:

The delay in removal of sludge from the solar ponds and the requirement for an IM/IRA for the surge tanks will impact the scheduled start of the RFI/RI field activities in January 1992. The public comment period for the OU 4 Solar Evaporation Ponds IM/IRA Decision document was closed on November 9, 1991. Public comments were relatively minor. EPA and CDH comments were received on November 20, 1991. EPA and CDH comments on the IM/IRA were significant. Presently, work is being done to review and address both public and regulatory agencies comments and prepare a Responsiveness Summary to be included in the Final IM/IRA document. Completion of the first draft of the Final IM/IRA, including revisions, is scheduled for early January 1992.

OPEN ITEMS: None

3.5 OU 5 - WOMAN CREEK

DESCRIPTION:

This activity encompasses assessment and remediation in the Woman Creek drainage of ten Individual Hazardous Substance Sites (IHSS). They are the Original Landfill (IHSS 115), the Ash Pits (IHSS 133.1 - 133.4), the Incinerator (IHSS 133.5), the Concrete Wash Pad (IHSS 133.6), the Detention Ponds C-1 and C-2 (IHSS 142.10 and 142.11) and the Surface Disturbance (IHSS 209), southeast of Building 881. Two additional surface disturbances have been identified and are located, one south of the Ash Pits and a second west of IHSS 209. These last two sites have been included in the OU 5 Work Plan.

SCOPE OF WORK CHANGES:

A geophysical survey, conceptual model, and the incorporation of Smart Creek/Ditch is being added into the OU 5 RFI/RI Work Plan.

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Phase I RFI/RI Work Plan	05 Apr 91
Submit Final Phase I RFI/RI Work Plan	30 Aug 91

NOVEMBER WORK ACTIVITY STATUS:

A meeting was held among DOE, EG&G, EPA and CDH on November 11, 1991 regarding comments on the Final Phase I RFI/RI OU 5 Woman Creek Priority Drainage Work Plan. At the meeting, DOE requested an extension from December 1, 1991 to December 9, 1991 for submittal of the revised Work Plan. It was also requested that a proposal for the sampling plan for the Smart Ditch area be presented by January 17, 1991 to EPA and CDH. The December 9, 1991 extension was approved; the proposal for the sampling plan is under consideration by EPA and CDH.

Additional rationale and clarification of the work to be performed in the Work Plan could satisfy the majority of the regulatory agencies' concerns. A geophysical survey, conceptual model, and the incorporation of Smart Creek/Ditch is being added into the OU 5 Work Plan.

Fall flora and fauna tissue and ecological community survey field activities for OU 5 environmental evaluation have been completed. Data analysis of the ecological community survey data began immediately, and tissue samples will be sent to the laboratories as soon as possible.

PLANNED WORK FOR DECEMBER:

Delivery to the regulatory agencies of the revised Final Phase RFI/RI OU 5 Woman Creek Drainage Work Plan is scheduled for December 9, 1991.

PROBLEMS:

The Statement of Work (SOW) for the field activities has not been released for bids because of the disapproval by EPA and CDH of the Work Plan for OU 5; therefore, field activities will not begin as currently scheduled.

OPEN ITEMS: None

3.6 OU 6 - WALNUT CREEK

DESCRIPTION:

This activity encompasses assessment and remediation in the Walnut Creek Drainage of twenty-two Individual Hazardous Substance Sites (IHSSs). They are the A-series Detention Ponds, Ponds A-1 through A-4 (IHSS 142.1 through 142.4) and 142.12; the B-series Detention Ponds, Ponds B-1 through B-5 (IHSS 142.5 through 142.9); the North, Pond, and South Area Spray Fields (IHSS 167.1, 167.2 and 167.3); the East Area Spray Field (IHSS 216.1), the Trenches A, B and C (IHSS 166.1, 166.2 and 166.3); the Sludge Dispersal Area (IHSS 141); the Triangle Area (IHSS 165), and the Old Outfall Area (IHSS 143). One additional site, the Soil Dump Area (IHSS 156.2), was moved from OU 14 to OU 6 in 1991. Surface and subsurface soil samples will be taken on a 150-foot grid across IHSS 115 instead of the 50-foot grid around the perimeter as proposed in the IAG. In addition, one monitoring well will be drilled 20 feet into bedrock within the IHSS and will be completed in bedrock if a sandstone zone is encountered. Five bedrock groundwater monitoring wells will be installed in the vicinity of North Walnut Creek during the OU 6 remedial investigation. The purpose of these wells is to characterize the bedrock in the vicinity of the A-series ponds. Two IHSSs, Property Utilization and Disposal Yard (PU&D Yard) (IHSS 170) and Property Utilization and Disposal Container Storage Facilities (IHSS 174) have been moved from OU 6 to OU 10.

Sediment samples will be collected from the drainage in OU 6 to characterize areas where existing data is currently lacking. Proposed sediment sample locations have been located along each stream segment on North and South Walnut creeks where additional characterization is needed. Based on a review of the data collected at the 17 existing locations along the OU 6 drainage, a significant amount of information exists about the sediments in many parts of OU 6. As a result, the sampling locations specified in the RFI/RI Work Plan have been reduced.

The Field Sampling Plan has been modified for the Triangle Area (IHSS 165) and the Old Outfall Area (IHSS 143) so that the surface soil sampling specified in the IAG can be taken from the original surface of these units. This will entail using borings to drill down to the original land surface and collecting samples at and below this surface.

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Phase I RFI/RI Work Plan	19 Apr 91
Submit Final Phase I RFI/RI Work Plan	16 Sep 91

NOVEMBER WORK ACTIVITY STATUS:

Incorporation of EPA and CDH comments from the Final Phase I RFI/RI Work Plan for OU 6 Walnut Creek Drainage continued. Additional rationale and clarification of the work to be performed in the Work Plan could satisfy the majority of the regulatory agencies' concerns. A conceptual model is being added to

the revised Work Plan. The date for the revisions of OU 6 Work Plan to be returned to EPA and CDH for review and approval is December 15, 1991.

PLANNED WORK FOR DECEMBER:

Delivery to the regulatory agencies of the revised Final Phase I RFI/RI OU 6 Walnut Creek Drainage Work Plan is scheduled for December 15, 1991.

PROBLEMS:

The Statement of Work (SOW) for the field activities has not been released for bid because of the disapproval by EPA and CDH of the Work Plan for OU 6; therefore, field activities will not begin as currently scheduled.

OPEN ITEMS: None

3.7 OU 7 - PRESENT LANDFILL

DESCRIPTION:

The Present Landfill Operable Unit (OU) 7 is located north of the plant complex on the western edge of an unnamed tributary of North Walnut Creek and is comprised of two Individual Hazardous Substance Sites (IHSS). IHSS 114 includes landfill waste and leachate at the Present Landfill, soils beneath the landfill potentially contaminated with leachate, and sediments and water in the East Landfill Pond. IHSS 203 contains potentially contaminated soils at the Inactive Hazardous Waste Storage Area. The Present Landfill began operation in August of 1968 and was originally constructed to provide for disposal of RFP's nonradioactive and nonhazardous wastes. In September 1973, tritium was detected in leachate from the landfill. During the mid-1980s, extensive investigations were conducted on the waste streams being disposed into the landfill, and consequently, hazardous wastes/hazardous constituents were identified. Although currently operating as a nonhazardous sanitary landfill, the facility is considered an inactive hazardous waste disposal unit undergoing RCRA closure.

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Phase I RFI/RI Work Plan	08 Jun 90
Submit Final Phase I RFI/RI Work Plan	28 Aug 91

NOVEMBER WORK ACTIVITY STATUS:

EPA and CDH comments are being incorporated into the final Phase I RFI/RI Work Plan. The final Work Plan will be delivered to EPA and CDH by December 6, 1991.

PLANNED WORK FOR DECEMBER:

EPA and CDH comments are being incorporated into the final Phase I RFI/RI Work Plan. The final Work Plan will be delivered to EPA and CDH by December 6, 1991.

PROBLEMS: None

OPEN ITEMS: None

3.8 OU 9 - ORIGINAL PROCESS WASTE LINES

DESCRIPTION:

This activity involves characterizing a series of tanks and associated process waste lines. The Original Process Waste Lines (OPWL) consisted of a system of 57 designated pipe sections extending between 73 tanks and 24 buildings connected by 35,000 feet of buried pipeline that transferred process wastes from point of origin to on-site treatment plants. The system was placed into operation in 1952 and additions were made to the system through 1975. The original system was replaced over the 1975-1983 period by the new process waste system. Some tanks and lines from the original system have been incorporated into either the new process waste system or the fire water deluge collection system.

The original system is known to have transported or stored various aqueous process wastes containing low-level radioactive materials, nitrates, caustics and acids. Small quantities of other liquids were also introduced in the system, including pickling liquor from foundry operations, medical decontamination fluids, miscellaneous laboratory liquids from Building 123, and laundry effluent from Buildings 730 and 778. The RFI/RI plan includes inspection and sampling of the OPWL tanks and pipelines which are accessible, and soil sampling to determine the extent of contamination in the vadose zone. The soil sampling will be performed by test pits and borings at approximately 300 foot intervals along the pipelines and by borings around the tanks which are outdoors. Soil characterization studies will determine the need for soil removal and/or treatment. The results of the RFI/RI will determine the need for interim and/or final remediation action.

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Phase I RFI/RI Work Plan	08 Jun 90
Submit Final Phase I RFI/RI Work Plan	26 Nov 91

NOVEMBER WORK ACTIVITY STATUS:

The Final Phase I RFI/RI Work Plan for OU 9 was delivered to EPA and CDH on November 26, 1991, the IAG milestone date.

PLANNED WORK FOR DECEMBER:

The regulatory agencies have 21 working days to review and approve the Work Plan. Conditional approval is expected on the OU 9 Original Process Waste Lines Final Phase I RFI/RI Work Plan by January 6, 1992.

PROBLEMS: None

OPEN ITEMS: None

3.9 OU 10 - OTHER OUTSIDE CLOSURES

DESCRIPTION:

OU 10 is made up of 18 Individual Hazardous Substance Sites (IHSSs) scattered throughout the plant and consists of various hazardous waste units. Six of the IHSSs are located in the Protected Area (PA), two are located in the buffer zone near the present landfill, the remaining are located near various buildings throughout the plant. The types of wastes identified at these sites range from pondcrete/saltcrete storage and drum storage to a utilization yard with waste spills. A Draft Phase I RFI/RI Work Plan for OU 10 is currently in preparation. The primary components of the RFI/RI Work Plan for OU 10 will be a Field Sampling Plan (FSP), Baseline Risk Assessment Plan (BRAP), and an EE Work Plan. Interim Remedial Action (IRA) construction is scheduled to begin in early 1998.

Three additional IHSSs were transferred from other operable units to OU 10 after the draft RFI/RI Work Plan was completed in FY90. The draft Work Plan was based on the draft IAG which was modified during final IAG negotiations. A contract modification has been initiated to incorporate the three IHSSs into the draft Work Plan and to perform general upgrades to the Plan.

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit draft Phase I RFI/RI Work Plan	27 Nov 91*

*Actual submittal of Work Plan to the regulatory agencies was November 26, 1991, one day ahead of the IAG milestone date.

NOVEMBER WORK ACTIVITY STATUS:

The draft Phase I RFI/RI Work Plan for OU 10 - Other Outside Closures was submitted to EPA and CDH on November 26, 1991.

PLANNED WORK FOR DECEMBER:

The regulatory agencies have approximately 21 working days to review the Work Plan. Conditional approval is expected on the OU 10 Other Outside Closures draft Phase I RFI/RI Work Plan by March 4, 1992.

PROBLEMS: None

OPEN ITEMS: None

3.10 OU 11 - WEST SPRAY FIELD

DESCRIPTION:

The West Spray Field is located within the Rocky Flats property boundary, immediately west of the plant security area. The West Spray Field was in operation from April 1982 to October 1985. During operation, excess liquids from the solar evaporation ponds 207-B North and Center (contaminated groundwater in the vicinity of the ponds and treated sanitary sewage effluent) were pumped periodically to the West Spray Field for spray application. The spray field boundary covers an area of approximately 105.1 acres, 38.3 of which received direct application of hazardous waste. The RFI/RI process will entail field studies to determine the presence and levels of hazardous constituents in soil and groundwater.

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Phase I RFI/RI Work Plan	08 Jun 90

NOVEMBER WORK ACTIVITY STATUS:

A scoping meeting was held between DOE, EG&G, EPA and CDH on November 14, 1991 to resolve EPA and CDH comments on the draft OU 11 RFI/RI Work Plan.

PLANNED WORK FOR DECEMBER:

Incorporation of the regulatory agencies comments into the OU 11 Draft Phase I RFI/RI Work Plan continues. The Final Phase I RFI/RI Work Plan is scheduled for delivery to the regulatory agencies on January 2, 1992, the IAG milestone date.

PROBLEMS:

Western Aggregate has submitted a request to DOE to mine the mineral resources for which they own the rights and which are under a portion of the western edge of the Rocky Flats Plant. The land in question is located within Operable Unit 11 West Spray Field. DOE has had preliminary discussions with EPA on this matter, and EPA agrees with DOE that a decision for any mining operations should be delayed until the OU assessment is complete. DOE legal staff is reviewing the request from Western Aggregate. A meeting between the parties was held in September. The DOE Realty Officer is negotiating a mineral rights exchange which is tentatively scheduled to be completed by June 1992.

OPEN ITEMS: None

3.11 SITEWIDE ACTIVITIES

DESCRIPTION:

Sitewide activities include several tasks that encompass a wide variety of plans, procedures, reports, studies, and other activities required by the IAG and that apply to RFP environmental restoration activities in general. The activities include, but are not limited to, the Health and Safety Plan (HSP), a Sampling and Analysis Plan (SAP), a Plan for Prevention of Contaminant Dispersion (PPCD), the Community Relations Plan (CRP), the Discharge Limits for Radionuclides Work Plan, Treatability Study deliverables, the Background Study Plan, Administrative Record, State Response (support for CDH oversight), Historical Release Report, Operations Management, Decontamination Facilities, Contractor yard support, ER Waste handling facilities, geologic characterization, hydrogeologic characterization, and ground water monitoring.

SCOPE OF WORK CHANGES: None

TECHNICAL APPROACH CHANGES: None

MILESTONE ACCOMPLISHMENTS:

Submit Draft Background Study Report (Water)	15 Dec 89
Submit Draft Background Study Report (Soils)	15 Dec 89
Submit Draft Community Survey Plan	23 Jan 90
Submit Final Community Survey Plan	22 Mar 90
Submit Draft Health and Safety Plan	15 Aug 90
Submit Draft Quality Assurance Project Plan	29 Aug 90
Submit Draft Standard Operating Procedures	29 Aug 90
Submit Draft Plan for Prevention of Contaminant Dispersion	19 Sep 90
Submit Draft Treatability Study Plan	21 Sep 90
Submit Draft Community Relations Plan	01 Nov 90
Submit Final Health and Safety Plan	12 Nov 90
Submit Revised Background Study Report	21 Dec 90
Submit Final Community Relations Plan	22 Jan 91
Submit Final Quality Assurance Project Plan	01 Mar 91
Submit Final Standard Operating Procedures	01 Mar 91
Submit Draft Radionuclides Discharge Limits Plan	05 Apr 91
Submit Community Relations Plan Responsiveness Summary	21 Jun 91
Submit Final Treatability Study Plan	03 Jun 91
Submit Final Plan for Prevention of Contaminant Dispersion	22 Jul 91
Submit Final Plan Discharge Limits Radionuclides	16 Sep 91
Submit Final PPCD and Responsiveness Summary	25 Nov 91

NOVEMBER WORK ACTIVITY STATUS:

Plan for Prevention of Contaminant Dispersion

The Final Plan for Prevention of Contaminant Dispersion (PPCD) and Responsiveness Summary (RS) were delivered to EPA and CDH on November 25, 1991, the IAG milestone. EPA and CDH are scheduled to approve the documents by December 28, 1991.

Discharge Limits for Radionuclides

The public comment period for the Discharge Limits for Radionuclides Work Plan ended on November 21, 1991. The next milestone date is to address comments and submit the Responsiveness Summary and Final Plan to EPA and CDH on January 30, 1992.

Environmental Evaluations (EE)

Computer modeling work on fate and transport of contaminants was presented to the Risk Assessment Technical Working Group Meeting on November 4, 1991. Approximately 35 people from DOE, EG&G, EPA, HAZWRAP, CDH, the Colorado Division of Wildlife and the Fish and Wildlife Service of DOI were present. Discussions included the uses of models for human health risk assessment and environmental evaluations under the IAG, the current status of modeling activities and the future directions for modeling.

With the exception of a winter survey to be performed in January or February 1992, environmental evaluation field sampling for OU 1, OU 2, and OU 5 is now complete. Fall flora and fauna tissue and ecological community survey field activities for OU 1, OU 2, and OU 5 environmental evaluations have been completed. Data analysis of the ecological community survey data began immediately and tissue samples will be sent to the laboratories as soon as possible.

Sitewide Treatability Study Program

Plutonium in Soils Treatability Study Work Plans were submitted to EPA and CDH on November 29, 1991. The two Work Plans included in this document address Magnetic Separation and the TruClean Process, two technologies selected for the treatability studies in the final Treatability Study Plan dated August 26, 1991. All the comments by DOE, EG&G RFP, EG&G Nevada and Los Alamos Office of Technology have been incorporated into this document.

The Annual Report on Treatability Studies is scheduled to be submitted to EPA and CDH in March 1992.

A Draft Treatability Study Work Plan for Different Types of Oxidation/Reduction was reviewed. Comments are being incorporated into the document. Delivery of this Work Plan to EPA and CDH is scheduled for January 1992.

Field Activities Drum Usage

Monthly drum inspection was completed on all waste storage drums in the buffer zone that contain drill cuttings from field activities. At the present time there are four hundred 55-gallon drums in the buffer zone from drilling activities. All drums conform to the SOP for labeling and required paperwork.

Current field drilling activities are utilizing 55-gallon drums at the rate of approximately 60 drums per week. Four-hundred eighty new 55-gallon drums have been ordered for current drilling activities and are being delivered in four 120-drum shipments every two weeks starting November 15, 1991 and ending December 24, 1991.

Administrative Record File Delivery

The complete Administrative Record File Index, consisting of all the Operable Units and Sitewide Activities, was delivered to EPA and CDH for review and comment on November 5, 1991.

Microfiche Reader/Printers were delivered to the Rocky Flats Reading Room, Rocky Flats Environmental Monitoring Council and CDH on November 6, 1991. These reader/printers will be available to the public for reviewing the Administrative Record File.

The Administrative Record Files for Sitewide Activities and OU 4 were approved by EPA and CDH on November 7, 1991. The Administrative Record Files (paper copies) were delivered to the four repositories on November 8, 1991 for public review. The four repositories consist of the Rocky Flats Reading Room (Front Range Community College), and facilities at the Rocky Flats Environmental Monitoring Council, EPA and CDH.

Microfilming of the Sitewide Program and OU 4 files started November 12, 1991 and was completed on November 25, 1991. Verification of the microfiche for accuracy has begun and will continue through December. Delivery of the microfiche to the four repositories is scheduled for December 12, 1991.

Historical Release Report

A preliminary draft Historical Release Report (HRR) was reviewed by DOE and EG&G staff, and comments were completed on November 22, 1991. The comments are being incorporated into the HRR and the draft report is scheduled for delivery to EPA and CDH on January 8, 1992, the IAG milestone date.

PLANNED WORK FOR DECEMBER:

Revisions of EPA required Standard Operating Procedure for Threatened and Endangered Species Act. Revised procedures are scheduled for delivery to DOE on December 20, 1991.

Microfilming of the Sitewide Program and OU 4 files for the Administrative Record started on November 12, 1991 and was completed on November 25, 1991. Verification of the microfiche for accuracy has begun and will continue in early December. Delivery of the microfiche to the four repositories is scheduled for December 12, 1991.

Continue work on Draft Work Plan for the Treatability Study (TSWP).

Continue preparation of the Responsiveness Summary for Discharge Limits for Radionuclides Work Plan.

Four-hundred eighty new 55-gallon drums have been ordered for current drilling activities and are being delivered in four 120-drum shipments every two weeks starting November 15, 1991 and ending December 24, 1991.

PROBLEMS: None

OPEN ITEMS: None

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4.0 ROUTINE ENVIRONMENTAL MONITORING

The following generalized sampling schedule for Routine Environmental Monitoring is provided as requested in Section 210 of the IAG. Detailed quarterly monitoring schedules are prepared in advance and are available to EPA and CDH upon request from the Environmental Monitoring and Assessment Division, Environmental Management Department, and EG&G Rocky Flats, Inc. The schedules are lengthy; therefore, they are not reproduced here. An EPA- or State-authorized representative may make arrangements to observe fieldwork and to obtain split or duplicate samples.

SURFACE WATER AND SEDIMENTS:

Each of the Surface Water Stations (approximately 120 stations) are sampled monthly.

Each of the Sediment Stations (approximately 40 stations) are sampled quarterly.

Each surface water and sediment sample is analyzed for the following parameters:

CLP TCL VOAs
CLP TAL Metals
plus Cesium
Lithium
Molybdenum
Strontium
Tin

Major Anions
Radionuclides
Field Parameters
pH
Temperature
Specific Conductivity
Dissolved Oxygen (DO)
Turbidity

SOILS:

Each of the Soil Stations (located at a 1- and 2-mile radius from the plant center) are sampled annually.

Each soil sample is analyzed for plutonium and americium.

GROUNDWATER:

A total of 259 of the 371 Groundwater Stations are sampled quarterly; this includes alluvial wells, bedrock wells, and pre-1986 wells. Approximately one third of the wells are monitored monthly for water levels.

Each groundwater sample is analyzed for CLP TCL VOAs, CLP TAL Metals, as well as the following parameters:

Radiochemical Parameters		Inorganic Parameters	Field Parameters
Gross Alpha	Tritium	Nitrate/Nitrite	Dissolved Oxygen (DO)
Gross Beta	Lithium	Total Phosphorous	Specific Conductivity
Plutonium	Uranium	Ortho-Phosphate	Temperature
Americium	Cesium	Ammonia	Turbidity
Strontium	Tin		pH
Molybdenum			

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5.0 CONTRACTOR/SUBCONTRACTOR IDENTIFICATION

Contractors and subcontractors being used on the Rocky Flats Plant Environmental Restoration Program and the work they are performing are identified on the following list as required by paragraph 13 of the IAG.

OU	PROJECT	SUBCONTRACTOR	SUB-SUBCONTRACTOR	WORK DESCRIPTION	START DATE
1	Assessment	Ebasco	Dames & Moore Stoller Corp.	OU1 RFI/RI fieldwork (drilling, well development/ completion, sampling) and RI report	Apr-91
1	Remediation	Advance Tanks		Fabricate/Install effluent storage tanks for OU1 IRA	Oct-91
1	Remediation	Bruner		OU1 IRA ion exchange system	Feb-91
1	Remediation	E.T. LaFore		Installation of Phase II-A treatment system equipment for OU1 IRA	Jun-91
1	Remediation	Eng Sciences		Design Phase II-B French drain for OU1 881 Hillside IRA	Sep-90
1	Remediation	Jennison		Construct Phase II-B French drain at OU1 IRA	Aug-91
1	Remediation	P.S.I.		UV bench scale testing for volatile organics	Aug-91
2	Assessment	Woodward-Clyde		OU2 RFI/RI Work Plan (alluvial & bedrock) and RI fieldwork (drilling, well completion/development)	Sep-90
2	Assessment	Weston		OU2 RFI/RI Alluvial Work Plan	Nov-90
2	Remediation	Riedel Env. Svcs.		Fabricate/install/operate GAC/FTU system for South Walnut Creek Phase of OU2 IRA.	Apr-91
2	Remediation	Stearns Rogers		Performance Specification for chemical precipitation/ membrane/filtration system for South Walnut Creek Phase of OU2 IRA	Jun-91
2	Remediation	Weston		IRAP, EA, Risk Assessment, and Historical Assessment for Women Creek	Jun-91
2	Remediation	Woodward-Clyde		Conduct bench-scale tests on surface water	May-91
2	Remediation	TBD		Mfg./Install chem. precep/filitration unit for South Walnut Creek phase of OU 2 IRA	Dec-91
3	Assessment	IT Corporation	CH2M Hill	OU3 RI Work Plan	Mar-91
3	Assessment	IT Corporation	CH2M Hill	Revegetate offsite lands	Jun-91
4	Assessment	IT Corporation	Applied Environ.	OU4 RFI/RI Work Plan including Environmental Evaluation Plan and Quality Assurance Addendum	Sep-91
4	Remediation	IT Corporation		Prepare OU4 IM/IRA Action Plan	Jul-90
5	Assessment	Woodward-Clyde		OU5 RFI/RI Work Plan including Environmental Evaluation Plan and Quality Assurance Addendum	Feb-90
6	Assessment	Woodward-Clyde		OU6 RFI/RI Work Plan including Environmental Evaluation Plan and Quality Assurance Addendum	Feb-90

OU	PROJECT	SUBCONTRACTOR	SUB-SUBCONTRACTOR	WORK DESCRIPTION	START DATE
7	Assessment	IT Corporation	Stoller Corp.	OU7 RFI/RI Work Plan including Environmental Evaluation Plan and Quality Assurance Addendum	Apr-90
9	Assessment	IT Corporation		OU9 RFI/RI Work Plan including Environmental Evaluation Plan and Quality Assurance Addendum	Mar-90
10	Assessment	Ebasco		OU10 RFI/RI Work Plan including Environmental Evaluation Plan and Quality Assurance Addendum	TBD
11	Assessment	IT Corporation		OU11 RFI/RI Work Plan including Environmental Evaluation Plan and Quality Assurance Addendum	TBD
SW	Hist. Rel. Rep.	IT Corporation	Doty & Assoc.	Prepare Historical Release Report	Feb-91
SW	PCB Assess.	Ebasco	Stoller Corp.	Prepare PCB Assessment Report	Jan-92
SW	Adm. Record	QuantaLex		Maintain IAG Administrative Record	Oct-90
SW	Geolog. Char.	ASI		Geologic Characterization, Data Base, and graphics	Feb-90
SW	Monitoring	Ebasco		Analytical Services for groundwater, surface water, and sediment	Dec-90
SW	Monitoring	IT Corporation		Analytical Services for groundwater, surface water, and sediment	Jul-90
SW	Fld. Oversight	Ebasco	Stoller Corp.	ER field operations oversight	Oct-90
SW	Treatability	Ebasco		Sitewide treatability studies - Pu contaminated soils	Apr-90
SW	Treatability	Woodward-Clyde		Technical evaluation of sitewide treatability studies	Jul-90
SW	PPCD	Ebasco		Plan for Prevention of Contaminant Dispersion	Jun-90
SW	QA	Ebasco	SAIC	Develop and implement quality assurance program and field operations oversite	Dec-90
PM	Support	Ebasco	Stoller Corp.	Program Management Support	Feb-90